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SCIENCE FILE

Marmots' Call of the Wild

■ Dan Blumstein has spent 15 years studying what woodchucks' surprising repertoire of sounds is saying.

By STEVE HYMON, TIMES STAFF WRITER

For the past 15 years, Dan Blumstein has been trying to get inside the heads of marmots. This is not an easy thing to do, as some marmots are total head cases.

Blumstein is a professor of animal behavior ecology at UCLA, a job that asks him to explain why various species act as they do. He's also the world's reigning expert on marmot alarm calls.

Though this may seem an odd line of research--it's not exactly "Gorillas in the Mist"--Blumstein cites many reasons marmot alarm calls are worth pondering. Perhaps the most important is an overwhelming curiosity about how animals perceive the world. Or, to put it another way, he really wants to know why a woodchuck chucks. "It's a privilege," he says, "to try to understand this stuff."

Groundhogs, also known as woodchucks, are one of 14 species of marmot. Classified as rodents, marmots are close relatives of prairie dogs and ground squirrels. Most, but not all, live in the mountains. They are cute and playful. A Mongolian or Russian may opine that they are also delicious and make fine hats or wraps.

Blumstein's first serious encounter with the creatures came on a cycling trip in Asia in 1987, when he came across a colony of long-tailed marmots in the mountains of northern Pakistan.

When predators such as foxes or golden eagles were present, the marmots would sometimes issue alarm calls and then hide in their burrows until danger passed.

But what were the marmots saying with their whistle-like calls? Were they shrieking in terror? Telling their mortal enemies to get lost? Or screaming "fox" or "eagle" to other marmots?

The question that really bothered Blumstein: Why would a marmot risk alerting a predator to its whereabouts by whistling? Why not quietly retreat to a burrow?

Finding answers to those questions has required Blumstein to be inventive. As

part of an effort to better replicate natural threats, for example, so he could tape-record marmot whistles, Blumstein built a kite that resembled an eagle. Evil KnEagle, he called it.

Explaining this in one scientific journal, Blumstein and Walter Arnold wrote: "We attempted to launch the kite in such a way as to make it suddenly appear over targeted marmots without the marmots seeing the people flying the kite."

Because the kite was sometimes unwieldy, he constructed RoboBadger, a stuffed badger mounted on the chassis of a radio-controlled car. Maneuvering the car through marmot colonies often provoked calls--and proved science can be a great deal of fun.

Back in his lab, Blumstein used a computer to analyze frequency, tone and length of the chirps, yips, chucks and kee-aws that marmots sounded.

"We didn't have any indication marmots were saying 'eagle' or 'snow leopard' or 'wolf,'" he says. "But they were saying 'I'm scared, I'm more scared, now I'm getting less scared.' So they could communicate in some kind of dynamic way about risk."

Blumstein also spent time studying the social behavior of yellow-bellied marmots with a colleague, Ken Armitage, in the Rocky Mountains near Crested Butte, Colo. Armitage, a University of Kansas biologist, has carefully tracked this marmot colony every summer since 1962--making it one of the longest continuing studies of a mammal population.

"One of the fundamental questions that has emerged from our work is why do marmots decide to alarm call when they do," says Armitage. "Because we know they don't always call when there are threats."

When danger lurked, marmot mothers would sometimes whistle to warn a daughter, but not an aunt, uncle or niece. There were other strange behaviors. Mothers prevented daughters from reproducing. Infants were killed. Permanent expulsions from the colony were common.

In short, the colony of cute, fuzzy creatures resembled Peyton Place more than Disneyland.

In papers written over the last decade (many with Armitage and other researchers), Blumstein has focused on two key findings:

In yellow-bellied marmots, whistles are often intended to protect offspring. Besides good parenting, the whistles are an individual's way to ensure that their genes dominate future generations. Conversely, getting rid of genetic competition may be the reason marmots do not whistle to a distant relative about to become coyote chow.

"The name of the game is maximizing the number of your genes in future generations," says Blumstein. "Mathematically, it makes perfect sense."

His work also suggests that species of marmots with the most socially complex colonies also have the most elaborate whistles. In other words, the marmots that survive in a complex world may be the ones that can communicate.

"Part of the study of evolution is understanding the different ways species solve

common problems," says Blumstein. "Everyone has to eat, reproduce, sleep, hunt, protect their young. Some monkeys have different calls referring to different species. Marmots don't have a single word. That just goes to show there are different ways to solve a problem."

There is also a more practical side to his work, as understanding how an animal behaves is often the key to conservation of a species.

In 1997, Blumstein was summoned to Vancouver Island in British Columbia, Canada. The Vancouver Island marmot was on the verge of extinction. Only a few dozen remained in the wild, and a few dozen more were soon to be taken into captivity.

The problem was logging. In the 50 years after World War II, about 90% of the old-growth forests near the island's marmot colonies were clear cut. To marmots and deer, the new clear cuts resembled meadows and both species moved into this newly created habitat.

As a result, deer numbers on the island soared. Predators, namely mountain lions and wolves, learned that hanging out in the clear cuts often meant an easy meal of venison--with a marmot appetizer.

With the island's marmot population plummeting, Blumstein's mission was to determine if there was some reason the island's marmots, both in captivity and the wild, could no longer defend themselves against predators.

Blumstein brought in all his tools, RoboBadger included. In one experiment, he walked up to wild marmots holding a garbage bag. Blumstein would then rip off the bag to reveal a stuffed bobcat--an animal not even present on the island. Still, the marmots whistled.

The conclusion: Wild marmots were talented at recognizing predators. The reason they fell prey so often was plain bad luck.

Because the timber companies cut so much so quickly, many of the old clear cuts are disappearing as the area's forests regrow. Researchers believe that in coming decades this will result in fewer deer, cougars and wolves and more marmots.

"The question is, can we baby-sit the marmots for this period of time while they recover?" says Andrew Bryant, chief scientist of the island's Marmot Recovery Foundation.

Sitting in his UCLA office one spring day, Blumstein says conservation is not simply a matter of setting aside enough land to satisfy the needs of a particular species. Rather, it's ensuring that animals such as marmots or wallabies--another species he has worked with--have the behavioral tools they need to survive.

On Vancouver Island, two marmots will be released into the wild in late June. They'll join the 24 others that remain in the wild. This pair may survive, they may not.

But Blumstein and other researchers are confident of one thing: In their quest to make it from Monday to Sunday and do it all over again, these marmots will whistle while they work.

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